

x900 Series Switch and SwitchBlade® x908 Expansion Module Installation Guide



- XEM-1XP
- XEM-2XP
- XEM-2XS
- XEM-12S
- XEM-12Sv2
- XEM-12T
- XEM-12Tv2
- XEM-2XT
- XEM-24T
- XEM-STK

x900 Series Switch and SwitchBlade® x908 Expansion Module Installation Guide
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Contents

About this Guide	4
Compatible Switches and Operating Systems	5
Compatible Pluggable Optical Modules	6
Package Contents	6
XEM-1XP 10Gigabit XFP Port	7
XEM-2XP Dual 10Gigabit XFP Ports	9
XEM-2XS Dual 10Gigabit SFP+ Ports	11
XEM-12S 100/1000BASE-X SFP Ports	13
XEM-12Sv2 100/1000BASE-X SFP Ports	15
XEM-12T 10/100/1000BASE-T RJ-45 Ports	17
XEM-12Tv2 10/100/1000BASE-T RJ-45 Ports	19
XEM-2XT Dual 10GBASE-T RJ-45 Ports	21
XEM-24T 24 Tri-speed Gigabit Copper Ports	22
XEM-STK Stacking Ports	24
Installation Procedure	26
Obtaining Documentation and Resources	30

About this Guide

Optional expansion modules (XEMs) enable economical combinations of port type, speed and density in a single switch. Front bays in the switch allow quick and easy installation.

This Installation Guide describes how to install the following XEMs:

- XEM-1XP, a single XFP port for high-speed fibre connections
- XEM-2XP, a dual 10 GbE XFP port expansion module for high-speed fibre connections
- XEM-2XS, a dual 10 GbE SFP+ port expansion module for high-speed fibre and SFP+ Direct Attach copper connections
- XEM-12S, 12 SFP ports for copper and fibre links
- XEM-12Sv2, 12 SFP ports for copper and fibre links
- XEM-12T, 12 x 10/100/1000 Mbps RJ-45 ports
- XEM-12Tv2, 12 x 10/100/1000 Mbps RJ-45 ports
- XEM-2XT, a dual 10 GbE RJ-45 port expansion module for high-speed copper connections
- XEM-24T, 24 x RJ Point Five ports for high density cabling solutions
- XEM-STK, dual stacking ports for scalability and high availability

You can download the complete document set for x900 Series switches and SwitchBlade® x908 from www.alliedtelesis.com/support/software. For more information about the document set and other resources, see “[Obtaining Documentation and Resources](#)” on page 30.

Compatible Switches and Operating Systems

XEMs can be installed in the following switches:

- x900-12XT/S
- x900-24XT
- x900-24XT-N
- x900-24XS
- SwitchBlade x908

The SwitchBlade x908 can operate in Extended Mode to take advantage of larger table sizes and Link Aggregation Groups, as shown in the following table:

	Standard Mode	Extended Mode
MAC entries	16K	32K
LAGs	31	128

Extended Mode can be enabled when the following XEMs are installed in a SwitchBlade x908 switch:

- XEM-2XP
- XEM-2XS
- XEM-12Sv2
- XEM-12Tv2
- XEM-2XT
- XEM-24T

The AlliedWare Plus™ Operating System supports all XEMs. The AlliedWare® Operating System supports all XEMs except the XEM-STK, the XEM-2XP and the XEM-2XT.

Compatible Pluggable Optical Modules

For the latest list of approved SFP, SFP+ and XFP fibre transceivers plus SFP+ Direct Attach copper modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which SFP, SFP+, and XFP fibre transceivers and SFP+ Direct Attach copper modules are approved for use.

Package Contents

The following items are included with each XEM:

- this Installation Guide
- one warranty card

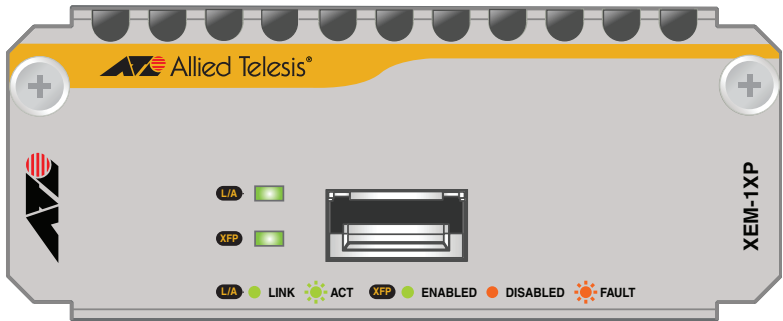
Contact your authorised Allied Telesis distributor or reseller if any items are damaged or missing.

XEM-1XP 10Gigabit XFP Port

The XEM-1XP single-port 10Gigabit Ethernet expansion module features:

- one XFP port
- LEDs showing port status
- support for hot-swappable XFP transceiver modules

Front view XEM-1XP



The following LEDs report operations and faults on the XEM-1XP.

LED	State	Description
L/A (Link Activity)	Green	An XFP transceiver module is installed and a 10Gb link has been established.
	Green flashing	An XFP transceiver module is installed and link activity is occurring.
	Off	A link has not been established.
XFP	Green	An XFP transceiver module is installed and enabled.
	Amber	An XFP transceiver module is installed but not operating or is disabled.
	Amber flashing	The installed XFP transceiver module has a fault.
	Off	An XFP transceiver module is not installed.

For the latest list of approved XFP transceiver modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which XFP transceiver modules are approved for use with the XEM-1XP.



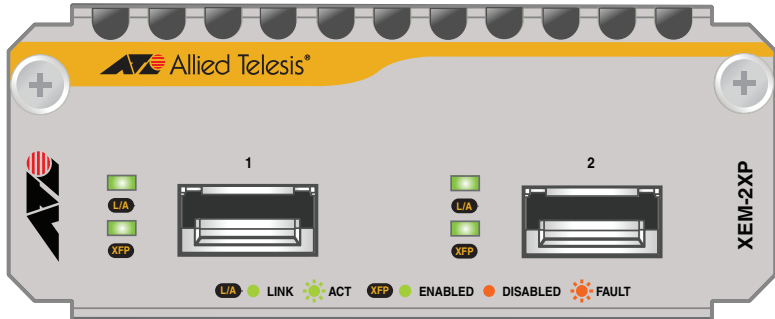
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-2XP Dual 10Gigabit XFP Ports

The XEM-2XP Dual 10Gigabit Ethernet expansion module features:

- two XFP ports
- four LEDs (one set for each XFP port) showing port status
- support for hot-swappable XFP transceiver modules

Front view XEM-2XP



The following LEDs report operations and faults on the XEM-2XP.

LED	State	Description
L/A (Link Activity)	Green	An XFP transceiver module is installed and a 10 Gbps link has been established.
	Green flashing	An XFP transceiver module is installed and link activity is occurring.
	Off	A link has not been established.
XFP	Green	An XFP transceiver module is installed and enabled.
	Amber	An XFP transceiver module is installed but not operating or is disabled.
	Amber flashing	The installed XFP transceiver module is not ready or has a fault.
	Off	An XFP transceiver module is not installed.

For the latest list of approved XFP transceiver modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which XFP transceiver modules are approved for use with the XEM-2XP.



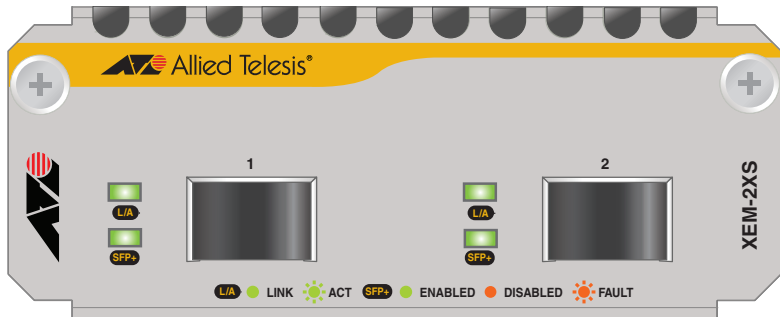
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-2XS Dual 10Gigabit SFP+ Ports

The XEM-2XS Dual 10Gigabit Ethernet expansion module features:

- two SFP+ ports
- four LEDs (one set for each SFP+ port) showing port status
- support for hot-swappable SFP+ fibre transceivers and Direct Attach copper modules

Front view XEM-2XS



The following LEDs report operations and faults on the XEM-2XS.

LED	State	Description
L/A (Link Activity)	Green	An SFP+ fibre transceiver or a Direct Attach copper module is installed and a 10 Gbps link has been established.
	Green flashing	An SFP+ fibre transceiver or a Direct Attach copper module is installed and link activity is occurring.
	Off	A link has not been established.

LED	State	Description
SFP+	Green	An SFP+ fibre transceiver or a Direct Attach copper module is installed and enabled.
	Amber	The port is disabled because either a non SFP+ fibre transceiver or a disabled Direct Attach copper module is installed.
	Amber flashing	The SFP+ fibre transceiver is not ready or has a fault. Direct Attach copper modules cannot indicate a fault.
	Off	An SFP+ fibre transceiver or a Direct Attach copper module is not installed.

For the latest list of approved SFP+ fibre transceivers and Direct Attach copper modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which SFP+ fibre transceivers modules and Direct Attach copper modules are approved for use with the XEM-2XS.



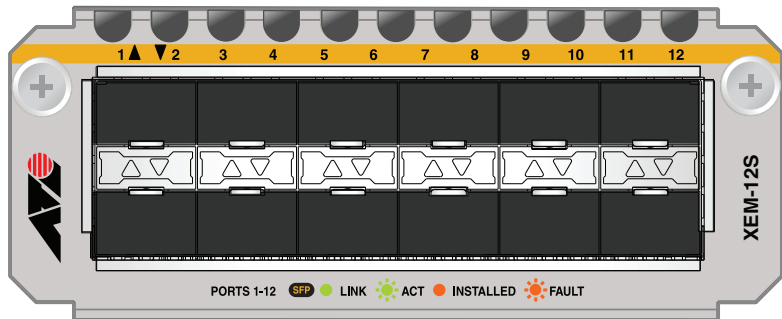
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-12S 100/1000BASE-X SFP Ports

The XEM-12S 12-port 100/1000BASE-X expansion module features:

- two rows of 6 SFP ports
- LEDs showing port status
- support for hot-swappable SFP transceiver modules
- NEBS compliant

Front view XEM-12S



The following LEDs report operations and faults on the XEM-12S.

LED	State	Description
SFP	Green	An SFP transceiver module is installed and a link has been established.
	Green flashing	An SFP transceiver module is installed and link activity is occurring.
	Amber	An SFP transceiver module is installed but a link has not been established.
	Amber flashing	An SFP transceiver module is installed but there is a fault.
	Off	An SFP transceiver module is not installed.

For the latest list of approved SFP transceiver modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which SFP transceiver modules are approved for use with the XEM-12S.



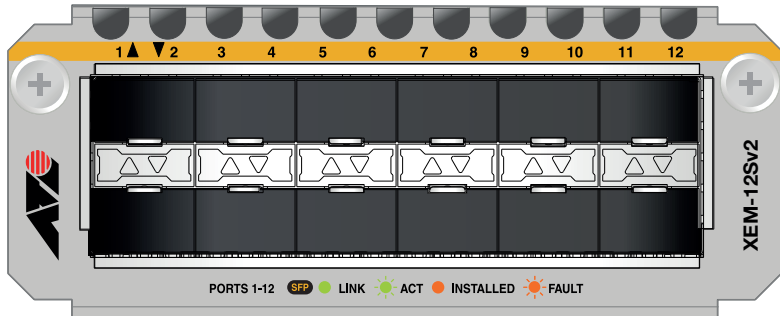
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-12Sv2 100/1000BASE-X SFP Ports

The XEM-12S 12-port 100/1000BASE-X expansion module features:

- two rows of 6 SFP ports
- LEDs showing port status
- support for hot-swappable SFP transceiver modules

Front view XEM-12Sv2



The following LEDs report operations and faults on the XEM-12Sv2.

LED	State	Description
SFP	Green	An SFP transceiver module is installed and a link has been established.
	Green flashing	An SFP transceiver module is installed and link activity is occurring.
	Amber	An SFP transceiver module is installed but a link has not been established.
	Amber flashing	An SFP transceiver module is installed but there is a fault.
	Off	An SFP transceiver module is not installed.

For the latest list of approved SFP transceiver modules, contact your authorised Allied Telesis distributor or reseller. See the most current revision available of the XEM datasheet (document number 617-000034) for further information about which SFP transceiver modules are approved for use with the XEM-12Sv2.



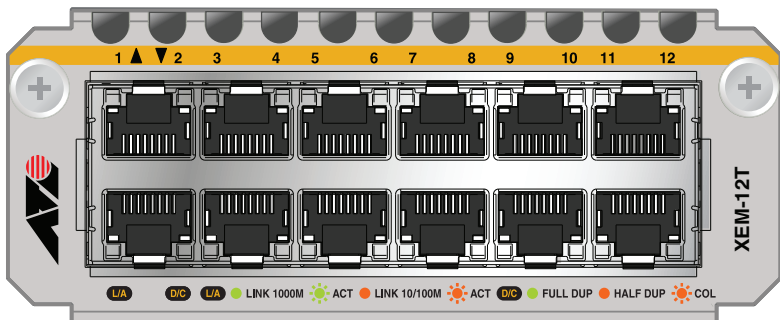
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-12T 10/100/1000BASE-T RJ-45 Ports

The XEM-12T 12-port RJ-45 expansion module features:

- two rows of 6 RJ-45 ports
- gigabit ports that support speeds of 10/100/1000 Mbps
- LEDs showing port status
- cable fault detection and distance-to-fault diagnostics on switches running the AlliedWare® operating system (see the *Test Facility* chapter in the Software Reference for the switch)

Front view XEM-12T



The following LEDs report operations and faults on the XEM-12T.

LED	State	Description
L/A (Link Activity)	Green	A 1000 Mbps link has been established.
	Green flashing	1000 Mbps activity is occurring.
	Amber	A 10/100 Mbps link has been established.
	Amber flashing	10/100 Mbps activity is occurring.
	Off	A link has not been established.
D/C (Duplex/ Collision)	Green	The port is operating in full duplex mode.
	Amber	The port is operating in half duplex mode.
	Amber flashing	Collisions are occurring.



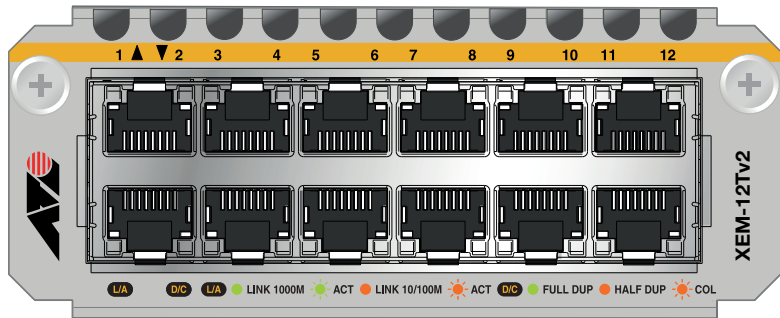
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-12Tv2 10/100/1000BASE-T RJ-45 Ports

The XEM-12Tv2 12-port RJ-45 expansion module features:

- two rows of 6 RJ-45 ports
- gigabit ports that support speeds of 10/100/1000 Mbps
- support for Energy Efficient Ethernet
- LEDs showing port status
- cable fault detection and distance-to-fault diagnostics on switches running the AlliedWare® operating system (see the *Test Facility* chapter in the Software Reference for the switch)

Front view XEM-12Tv2



The following LEDs report operations and faults on the XEM-12Tv2.

LED	State	Description
L/A (Link Activity)	Green	A 1000 Mbps link has been established.
	Green flashing	1000 Mbps activity is occurring.
	Amber	A 10/100 Mbps link has been established.
	Amber flashing	10/100 Mbps activity is occurring.
	Off	A link has not been established.

LED	State	Description
D/C (Duplex/ Collision)	Green	The port is operating in full duplex mode.
	Amber	The port is operating in half duplex mode.
	Amber flashing	Collisions are occurring.
	Off	A link has not been established.



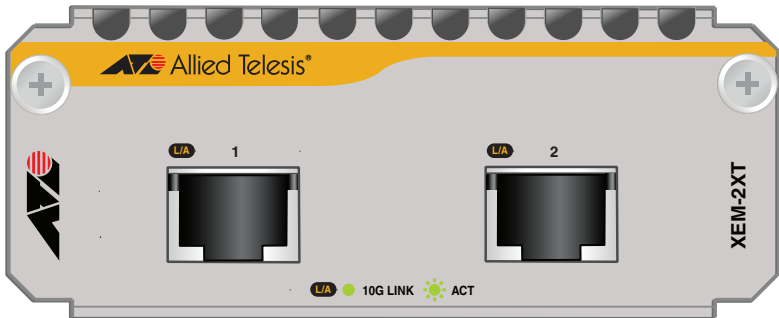
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-2XT Dual 10GBASE-T RJ-45 Ports

The XEM-2XT Dual 10GBASE-T RJ-45 expansion module features:

- two 10GBASE-T RJ-45 ports
- LEDs showing port status

Front view XEM-2XT



The following LEDs report operations and faults on the XEM-2XT.

LED	State	Description
L/A (Link Activity)	Green	A 10 Gbps link has been established.
	Green flashing	10 Gbps activity is occurring.
	Off	A link has not been established.



Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

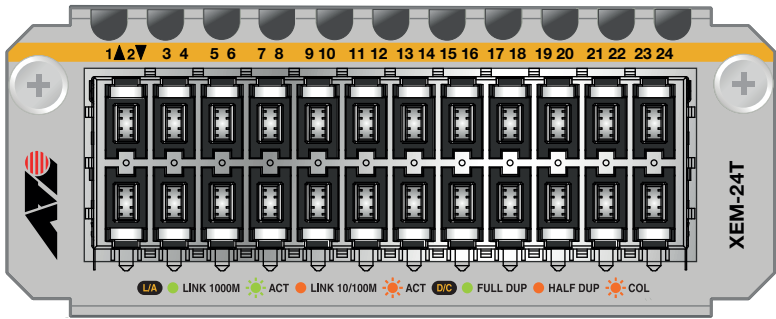
Note You must use Cat 6A cables to enable the XEM-2XT to achieve optimal performance. In noisy RF environments, we recommend shielded Cat 6A cables.

XEM-24T 24 Tri-speed Gigabit Copper Ports

The XEM-24T 24-port RJ Point Five expansion module features:

- two rows of 12 RJ Point Five ports
- gigabit ports that support speeds of 10/100/1000 Mbps
- support for Energy Efficient Ethernet
- LEDs showing port status
- cable fault detection and distance-to-fault diagnostics on switches running the AlliedWare® operating system (see the *Test Facility* chapter in the Software Reference for the switch)

Front view XEM-24T



The following LEDs report operations and faults on the XEM-24T.

LED	State	Description
L/A (Link Activity)	Green	A 1000 Mbps link has been established.
	Green flashing	1000 Mbps activity is occurring.
	Amber	A 10/100 Mbps link has been established.
	Amber flashing	10/100 Mbps activity is occurring.
	Off	A link has not been established.

LED	State	Description
D/C (Duplex/ Collision)	Green	The port is operating in full duplex mode.
	Amber	The port is operating in half duplex mode.
	Amber flashing	Collisions are occurring.
	Off	A link has not been established.



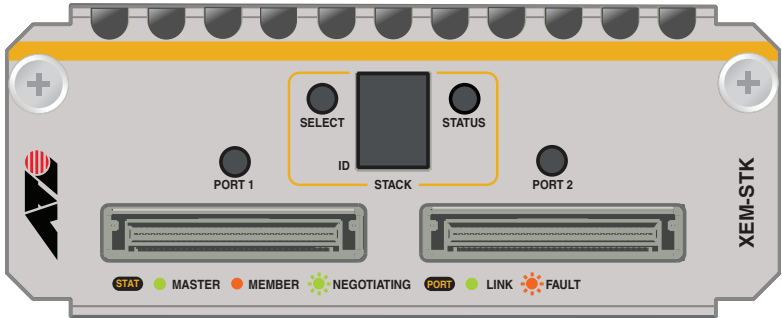
Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

XEM-STK Stacking Ports

The XEM-STK dual-port stacking expansion module features:

- two 15 Gbps full duplex stacking connections
- LEDs showing port and stack member status
- seven-segment stack ID display
- recessed Select button to reset stack ID to 1

Front view XEM-STK



The following LEDs report operations and faults on the XEM-STK.

LED	State	Description
Port 1	Green	A link has been established.
Port 2	Amber slow flashing	The link has a transmission fault.
Status	Green	The switch is the stack master.
	Amber	The switch is a stack member.
	Green flashing	The switch is in the process of learning the stack topology and selecting the stack master.
	Off	The switch is not a stack member.
ID	1 to 8	Numeric ID of the stack member.
	Off	The switch is not a stack member.

A choice of 0.5m or 2.0m stacking cables can be ordered separately. For the latest list of approved cables, contact your authorised Allied Telesis distributor or reseller.

The Select button resets the stack ID of this switch to 1, and causes the other members of the stack to be renumbered. Use this to put the stack into a pre-defined configuration for ease of installation.

Note You should install only one XEM-STK expansion module in a switch. If you install more than one, only the first expansion module is enabled.



Caution Allied Telesis recommends waiting 30 seconds after hot swapping any XEM before resuming normal operations. The switch must fully complete the bootup process before you can hot swap any XEM. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

Installation Procedure

The installation procedure and XEMs supported by each switch depend on the operating system running on the switch.

AlliedWare Plus™ Operating System

Switches running the AlliedWare Plus™ operating system support all XEMs. All XEMs except the XEM-STK are hot-swappable and can be installed following either of these procedures:

- “Installing or replacing XEMs without hot swap support” on page 27
- “Installing or replacing XEMs with hot swap support” on page 28

The XEM-STK is hot-removable only. To remove the XEM-STK, disconnect the stacking cables, loosen the thumbscrews on the faceplate and remove the XEM. To install or replace the XEM-STK, follow the procedure “Installing or replacing XEMs without hot swap support” on page 27.

AlliedWare® Operating System

Switches running the AlliedWare® operating system support all XEMs except the XEM-STK and the XEM-2XP. XEMs are not hot-swappable under the AlliedWare® operating system and must be installed following the procedure “Installing or replacing XEMs without hot swap support” on page 27.

Before you begin

- Unpack the XEM.

In an anti-static environment, remove the XEM from its packing material. Be sure to observe ESD precautions.



Caution Failure to observe proper anti-static procedures may damage the unit. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

- Verify the package contents if you have not already done so.

See “Package Contents” on page 6. If any items are damaged or missing, contact your authorised Allied Telesis distributor or reseller.

- Read the safety information for the switch.

Safety information is available in the Installation and Safety Guide that is shipped with each switch. You can also download this document from www.alliedtelesis.com/support/software.

- Gather necessary tools.

You may need a Phillips #2 screwdriver to adjust the thumbscrews on the XEM.

Installing or replacing XEMs without hot swap support

Follow this procedure to:

- install a XEM, except the XEM-STK, in a switch running the AlliedWare® operating system
- install a XEM-STK in a switch running the AlliedWare Plus™ operating system
- install a XEM without hot swapping in a switch running the AlliedWare Plus™ operating system

To install or replace a XEM:

1. If you are replacing a XEM, first save the switch configuration.

On switches running the AlliedWare® operating system, use the commands:

```
create config=<filename>.cfg
set config=<filename>.cfg
```

On switches running the AlliedWare Plus™ operating system, use the commands:

```
awplus>enable
awplus#copy running-config startup-config
```

2. If connected, disconnect the switch from its redundant power supply.
3. Disconnect the switch from its AC or DC power supply.
4. If you are replacing an existing XEM, disconnect any data cables.
5. Loosen the thumbscrews on the faceplate or existing XEM, and remove it.

Keep the faceplate for future use. If you remove a XEM, cover the bay with the faceplate to prevent dust and debris from entering it and to maintain proper airflow.
6. Carefully slide the new XEM into the empty bay until you feel it engage the rear plug.
7. Secure the XEM by tightening the thumbscrews.
8. Apply power to the switch by re-attaching the power cord.
9. If you disconnected a redundant power supply, reconnect it.

10. Restart the switch and verify the installation.

If you have a terminal connected to the asyn0 port, any error message is displayed during startup self-tests.

Confirm there is no error message about installation in the log file and that the switch has recognised the XEM.

On switches running the AlliedWare® operating system, use the commands:

```
show log
show system
```

On switches running the AlliedWare Plus™ operating system, use the commands:

```
awplus>show system
awplus>enable
awplus#show log
```

Installing or replacing XEMs with hot swap support



Caution It is recommended that you should wait 30 seconds between hot swapping any XEM to resume normal operations. Also ensure the XEM fastening thumbscrews are fully tightened. If you are unsure about correct procedures, contact your authorised Allied Telesis distributor or reseller.

Follow this procedure to hot swap a XEM in a switch running the AlliedWare Plus™ operating system. Note that the XEM-STK cannot be hot swapped.

1. If you are replacing a XEM, first save the switch configuration, by using the commands:

```
awplus>enable
awplus#copy running-config startup-config
```

2. If you are replacing an existing XEM, disconnect any data cables.
3. Loosen the thumbscrews on the faceplate or existing XEM, and remove it. Keep the faceplate for future use. If you remove a XEM, cover the bay with the faceplate to prevent dust and debris from entering it and to maintain proper airflow.
4. Carefully slide the new XEM into the empty bay until you feel it engage the rear plug.
5. Secure the XEM by tightening the thumbscrews.

6. Verify the installation.

If you have a terminal connected to the asyn0 port, any error message is displayed during installation.

Confirm there is no error message about installation in the log file and that the switch has recognised the XEM, by using the commands:

```
awplus>show system
```

```
awplus>enable
```

```
awplus#show log
```

Obtaining Documentation and Resources

The complete document set for x900 Series switches and SwitchBlade x908 includes:

- this Installation Guide
- the *x900 Series Switch and SwitchBlade[®] x908 Installation and Safety Guide*, which describes how to install the switch and includes important safety and statutory information
- the *x900 Series Switch and SwitchBlade[®] x908 Hardware Reference*, which contains detailed information on the switch and its hardware features
- the *Removable Power Supply and Fan Installation Guide*, which describes how to install power supply units and fan-only modules in the switch
- the *x900 Series Switch AlliedWare[®] Operating System Software Reference*, which contains detailed information on configuring switches running the AlliedWare[®] operating system
- the *AlliedWare Plus[™] Operating System Software Reference*, which contains detailed information on configuring switches running the AlliedWare Plus[™] operating system

You can download these documents and updates from www.alliedtelesis.com/support/software.

You need Adobe[®] Acrobat[®] Reader[®] software to view, search, or print these documents. You can download it from www.adobe.com.

Other resources

How-To Notes describe a range of standard Allied Telesis solutions, and include technical tips and guides to configuring specific hardware and software features. You can download the latest How-To Notes from www.alliedtelesis.com/resources/literature/howto.aspx.

MIBs supported by Allied Telesis products can be downloaded from www.alliedtelesis.com/support/software.

Microsoft[®] Visio[®] stencils for Allied Telesis products can be downloaded from www.alliedtelesis.com/resources/images/visio.aspx.

AT-TFTP Server for Windows is a TFTP (*Trivial File Transfer Protocol*) server for transferring software versions, configuration scripts and other files between a PC and the switch. You download AT-TFTP Server from www.alliedtelesis.com/support/software.

Contacting us

With locations covering all of the established markets in North America, Latin America, Europe, Asia, and the Pacific, Allied Telesis provides localized sales and technical support worldwide. To find the representative nearest you, visit us on the Web at www.alliedtelesis.com.